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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/565,152

Applicant(s)

MCNIE ET AL.

Examiner

Chad H. Smith

Art Unit

2874

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 November 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-43 and 47 is/are pending in the application.
- 4a) Of the above claim(s) 4 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 13 is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-12, 14-43 and 47 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB-08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

With regards to the arguments presented on page 15 and 16, a quarter-wave plate not being shown in the Foord. reference, Applicant is advised to look at page 347 as both figures show clearly a quarter-wave plate. Applicant argues that a quarter-wave plate does not modulate, but **modulate means to adjust, m-w.com**, as a quarter-wave plate adjusts the polarization.

Applicant's arguments with respect to claims 1 – 43 have been considered but are moot in view of the new ground(s) of rejection.

Allowable Subject Matter

Claim 13 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The following is a statement of reasons for the indication of allowable subject matter: The prior art of record, taken alone or in combination, fails to disclose or render obvious wherein said output means is arranged to couple each of said plurality of modulated beams into one of a plurality of output optical fibres.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 18, 19, 43 and 47 is rejected under 35 U.S.C. 102(b) as being anticipated by Jenkins et al. (U.S. Patent # 5,917,596).

In Re claim 1, '596 teaches a transmitter apparatus comprising one or more lasers (804), modulation means to intensity modulate radiation output by each of said one or more lasers (col. 27, lines 33 – 36), and output means for outputting the modulated radiation produced by the modulation means (850); and hollow core optical waveguides formed in a substrate for guiding radiation from the one or more lasers to the modulation means and from the modulation means to the output means (838, 840, 844, and 848). Furthermore, the recitation “for information modulating” is a functional recitation. While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997).

In Re claims 18 and 19, '596 teaches beam shaping means (814).

In Re claim 43, '596 teaches a base and lid portion (312 and 316, respectively).

In Re claim 47, '596 teaches a transmitter apparatus comprising: one or more lasers (804), a modulator for information modulating radiation output by each of said one or more lasers (col. 27, lines 33 – 36), a transmitter for outputting the modulated radiation produced by the modulator (850); and hollow core optical waveguides formed in a substrate for guiding radiation from the one or more lasers to the modulator and from the modulator to the transmitter

(838, 840, 844, and 848). Furthermore, the recitation “for information modulating” is a functional recitation. While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 1 – 3, 5, 6, 8, 9, 14, 16 – 18, 21, 22, and 37 – 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Foord et al. “(A Hollow Waveguide Integrated Optic System with at Integrated Laser Source”, Proceeding of SPIE, Vol. 4035 (2000), Pages 346 – 353) in view of Akashi et al. (U.S. Patent # 6,934,448 B2).

In Re claims 1, 5, and 22, Foord et al. teaches a transmitter apparatus comprising one or more lasers (CO₂), modulation means to for information modulating radiation output by each of said one or more lasers (quarter-wave plate, fig. 1, pg. 347), characterized in that the apparatus comprises hollow core optical waveguides formed in a substrate (HOWIO) for guiding radiation from the one or more lasers to the modulation means and from the modulation means to the output means (section 1 par. 2). Foord et al. is silent to an output means for outputting the modulated radiation produced by the modulation means. '448 teaches attaching an optical fiber via a v-groove on a semiconductor substrate for alignment to the laser diode (col. 8, lines 14 – 16). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Foord et al.'s transmitting apparatus with a hollow waveguide with '448's teaching attaching an optical fiber via a v-groove on a semiconductor substrate and integrating a v-groove at the output of the HOWIO subsystem for an optical fiber, which then allows for a multitude of mounting arrangements of the HOWIO as the optical fiber can be easily maneuvered to direct the output at the desired target.

Furthermore, the recitation “for information modulating” is a functional recitation. While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997).

In Re claims 2 and 3, Foord et al. teaches the quarter-wave plate as a discrete component in an alignment slot (fig. a).

In Re claim 6, '448 teaches a v-groove (3).

In Re claim 8, '448 teaches a lens (51).

In Re claim 9, Foord et al. teaches a laser (fig. 1a and section 2, par. 5).

In Re claim 14, '448 teaches a semiconductor laser (laser diode)

In Re claim 16, Foord et al. teaches a detector (fig. 3, beam profiler).

In Re claim 17, Foord et al. teaches an optical isolator (partially reflecting mirror, as it isolates part of the optical energy by allowing it to transmit instead of reflect).

In Re claim 18, Foord et al. teaches beam shaping means as the hollow waveguides themselves shape the beam.

In Re claim 21, Foord et al. teaches EO modulator (pg. 348 par. 3).

In Re claims 37 and 38, applicant is claiming the product including the process of making the transmitter apparatus, and therefore are of "product-by-process" nature. The courts have been holding for quite some time that: the determination of the patentability of product-by-process claim is based on the product itself rather than on the process by which the product is made. In re Thrope, 777 F. 2d 695, 227 USPQ 964 (Fed. Cir. 1985); and patentability of claim to a product does not rest merely on a difference in the method by which that product is made. Rather, it is the product itself which must be new and unobvious. Applicant has chosen to claim the invention in the product form. Thus a prior art product which possesses the claimed product characteristics can anticipate or render obvious the claim subject matter regardless of the manner in which it is fabricated. A rejection based on 35 U.S.C. section 102 or alternatively on 35 U.S.C. section 103 of the status is eminently fair and acceptable. In re Brown and Saffer, 173 USPQ 685 and 688; In re Pilkington, 162 USPQ 147. As such no weight is given to the process steps recited in claims 37 and 38.

In Re claim 39, Foord et al. teaches hollow core of a rectangular cross section (pg. 346, par. 3).

In Re claim 40, Foord et al. teaches guiding in the fundamental mode (pg. 349, par. 3).

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Foord et al. "(A Hollow Waveguide Integrated Optic System with at Integrated Laser Source", Proceeding of SPIE, Vol. 4035 (2000) Pages 346 – 353) in view of Akashi et al. (U.S. Patent # 6,934,448) and further in view of Nelson et al. (U.S. Patent # 3,984,332).

The previous combination teaches the apparatus of claim 6 as previously discussed above, but is silent to a lensed output optical fiber. '332 teaches a lensed output optical fiber (col. 4, lines 37 – 40). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of the previous combination with '322's teaching of a lensed output optical fiber to minimize dispersion.

Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Foord et al. "(A Hollow Waveguide Integrated Optic System with at Integrated Laser Source", Proceeding of SPIE, Vol. 4035 (2000) Pages 346 – 353) in view of Akashi et al. (U.S. Patent # 6,934,448 B2) and further in view of Gotoda (U.S. Patent # 6,643,309 B1).

The previous combination teaches the apparatus of claim 1 as previously discussed above, but is silent to a wavelength tuneable semiconductor laser. '309 teaches a wavelength tuneable semiconductor laser (col. 10, lines 60 – 64). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of the previous combination with '309's teaching of a wavelength tuneable semiconductor laser being that this type of laser consumes very little current when tuning.

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Foord et al. "(A Hollow Waveguide Integrated Optic System with at Integrated Laser Source", Proceeding of SPIE, Vol. 4035 (2000) Pages 346 – 353) in view of Akashi et al. (U.S. Patent # 6,934,448) and further in view of Karlin et al. (U.S. Patent # 4,583,539).

The previous combination teaches the apparatus of claim 18 as previously discussed above, but is silent to a tapered hollow core waveguide. '539 teaches a hollow tapered waveguide used to focus and transport the laser beam. It would have been obvious to one of

ordinary skill in the art at the time the invention was made to combine the teachings of the previous combination with '539's teaching of a hollow tapered waveguide used to focus and transport the laser beam so that the beam stays strong as it propagates to its target.

Claims 35 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jenkins et al. (U.S. Patent # 5,917,596) in view of Jones (U.S. PG Pub. # 2005/0213880 A1).

'596 teaches the apparatus of claim 1 as previously discussed above, but is silent to the substrate comprising SOI. '880 teaches using SOI to serve as cladding to help confine light. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of '596's apparatus with '880's teaching of using SOI to serve as cladding to help confine light as this lessens the attenuation of the optical signal.

Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over Foord et al. "(A Hollow Waveguide Integrated Optic System with an Integrated Laser Source", Proceeding of SPIE, Vol. 4035 (2000) Pages 346 – 353) in view of Akashi et al. (U.S. Patent # 6,934,448 B2) and further in view of Wojnarowski et al. (U.S. Patent # 5,525,190).

The previous combination teaches the apparatus of claim 1 as previously discussed above, but is silent to a reflective coating. '190 teaches a reflective coating (col. 4, lines 30 – 31).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of the previous combination with '190's teaching of a reflective coating so as to lessen the optical attenuation of the optical signal.

Claims 1, and 10 – 12, 23 – 28, 33 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jenkins et al. “A Hollow Waveguide Integrated Optic System for a 10.6 um Range-Doppler Imaging Lidar”, Proceeding of SPIE, Vol. 4034 (2000) Pages 108 – 113) in view of Akashi et al. (U.S. Patent # 6,934,448 B2).

In Re claims 1 and 10, Jenkins et al. teaches a transmitter apparatus comprising one or more lasers (MO and LO), modulation means for information modulating radiation output by each of said one or more lasers (half-wave plate, fig. 2, pg. 109), hollow core optical waveguides formed in a substrate (HOWIO) for guiding radiation from the one or more lasers to the modulation means and from the modulation means to the output means (section 1 par. 2). Foord et al. is silent to an output means for outputting the modulated radiation produced by the modulation means. '448 teaches attaching an optical fiber via a v-groove on a semiconductor substrate for alignment to the laser diode (col. 8, lines 14 – 16). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Jenkins et al.'s transmitting apparatus with a hollow waveguide with '448's teaching attaching an optical fiber via a v-groove on a semiconductor substrate and integrating a v-groove at the output of the HOWIO subsystem for an optical fiber, which then allows for a multitude of mounting arrangements of the HOWIO as the optical fiber can be easily maneuvered to direct the output at the desired target.

Furthermore, the recitation “for information modulating” is a functional recitation. While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997).

In Re claim 11, Jenkins et al. teaches a mode-locked and C.W. laser

In Re claim 12, Jenkins et al. teaches combining the beams to output to port D (pg. 109). Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to duplicate the fiber attachment means to all the outputs of the device for ease of optical alignment with each outputs associated detector.

In Re claim 41, Jenkins et al. teaches two laser sources and therefore the hollow channels would have to be able to guide radiation in multiple modes.

In Re claim 23, Jenkins et al. teaches at least one hollow core optical waveguide formed in a substrate (HOWIO); one or more detectors (fig. 3) and said at least one hollow waveguide guiding said radiation in two transverse directions (fig. 2, as the return signal must be analyzed). Jenkins et al. is silent to one or more optical fibre attachment means, the one or more optical fibre attachment means adapted to receive one or more optical fibres, wherein said radiation is guided from the one or more optical fibres to the one or more detectors by said at least one hollow core optical waveguide. '448 teaches attaching an optical fiber via a v-groove on a semiconductor substrate for alignment to the laser diode (col. 8, lines 14 – 16). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Jenkins et al. 's transmitting apparatus with a hollow waveguide with '448's teaching attaching an optical fiber via a v-groove on a semiconductor substrate and integrating a

v-groove at the output of the HOWIO subsystem for an optical fiber, which then allows for a multitude of mounting arrangements of the HOWIO as the optical fiber can be easily maneuvered to direct the output at the desired target.

In Re claim 24, Jenkins et al. teaches a plurality of detectors (fig. 3).

In Re claim 25, the previous combination teaches the claimed invention except for a plurality of attachment means and a plurality of optical fibres. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use an attachment means and an optical fiber at each of the detectors to avoid difficulty in alignment of all the detectors, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

In Re claim 26, it has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex Parte Masham*, 2 USPQ F.2d 1647 (1987).

In Re claim 27, the fiber attachment means at the output (Main T/R) with receive a signal different from the one it transmits.

In Re claim 28, the Brewster plate separates the receiving signal from the transmitting signal each goes to a Pulse Detector and a Het. Signal Detector (fig. 3).

In Re claim 33, Jenkins et al. teaches a transmitter and receiver (fig. 3).

Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jenkins et al. "A Hollow Waveguide Integrated Optic System for a 10.6 um Range-Doppler Imaging Lidar", Proceeding of SPIE, Vol. 4034 (2000) Pages 108 – 113) in view of Akashi et al. (U.S. Patent # 6,934,448 B2) and further in view of Byren et al. (U.S. Patent # 6,765,633 B2).

The previous combination teaches the apparatus of claim 33 as previously discussed above, but is silent to the receiver and transmitter being formed on a common substrate. '633 teaches a transceiver (58) package. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the previous combination with '633's teaching of a laser transceiver so as to minimize the size of the apparatus.

Claim 23, and 29 – 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Foord et al. "(A Hollow Waveguide Integrated Optic System with at Integrated Laser Source", Proceeding of SPIE, Vol. 4035 (2000) Pages 346 – 353) in view of Akashi et al. (U.S. Patent # 6,934,448 B2).

An information modulated radiation receiver apparatus comprising: at least one hollow core optical waveguide formed in a substrate (HOWIO); one or more detectors (section 1, par. 1)

and said at least one hollow waveguide guiding said radiation in two transverse directions (section 3, par. 2 and fig. 1 as the return signal must be analyzed). Foord et al. is silent to one or more optical fibre attachment means, the one or more optical fibre attachment means adapted to receive one or more optical fibres, wherein said radiation is guided from the one or more optical fibres to the one or more detectors by said at least one hollow core optical waveguide. '448 teaches attaching an optical fiber via a v-groove on a semiconductor substrate for alignment to the laser diode (col. 8, lines 14 – 16). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Foord et al. 's transmitting apparatus with a hollow waveguide with '448's teaching attaching an optical fiber via a v-groove on a semiconductor substrate and integrating a v-groove at the output of the HOWIO subsystem for an optical fiber, which then allows for a multitude of mounting arrangements of the HOWIO as the optical fiber can be easily maneuvered to direct the output at the desired target.

In Re claim 29, Foord et al. teaches a VOA (section 2, par. 3, as an EO can vary the amplitude which is changing the attenuation).

In Re claim 30, Foord et al. teaches a wavelength selective filter (the laser).

In Re claim 31, '448 teaches mode matching means (51).

Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Foord et al. "(A Hollow Waveguide Integrated Optic System with at Integrated Laser Source", Proceeding of

SPIE, Vol. 4035 (2000) Pages 346 – 353) in view of Akashi et al. (U.S. Patent # 6,934,448) and further in view of Nelson et al. (U.S. Patent # 3,984,332).

The previous combination teaches the apparatus of claim 6 as previously discussed above, but is silent to a lensed output optical fiber. '332 teaches a lensed output optical fiber (col. 4, lines 37 – 40). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of the previous combination with '322's teaching of a lensed output optical fiber to minimize dispersion.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chad H. Smith whose telephone number is (571) 270-1294. The examiner can normally be reached on Monday-Thursday 7:00 am - 4:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Uyen-Chau Le can be reached on 571-272-2397. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Chad H Smith/
Examiner, Art Unit 2874

/Sung H. Pak/
Primary Examiner, Art Unit 2874